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Tort Damages

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In this Chapter, I provide an overview of Law and Economics literature regarding tort damages. Where necessary, attention is also spent to rules of tort liability. Both types of rules provide behavioral incentives to both injurers and victims, with respect to their level of care and activity. Moreover, they determine who is the residual risk bearer. Many topics determine who ultimately bears which risks, among which the applicable liability rule (strict liability or negligence), the question which losses are included in the damages and which are excluded, the issue whether punitive damages are possible, how future losses, damages for nonpecuniary losses and fatal accidents are calculated, and how the topic of multiple tortfeasors is dealt with. Finally, empirical research regarding tort damages is briefly touched upon. The Chapter is followed by an extensive bibliography.

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JEL Classification: K13

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TORT DAMAGES

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1. Introduction

In the economic analysis of tort law, minimization of primary accident costs (deterrence), secondary accident costs (optimal risk spreading and risk bearing) and tertiary accident costs (administrative costs) is regarded as the central objective (Calabresi, 1977, pp. 24 ff). The prospective of being held liable and having to pay damages provides potential tortfeasors with behavioral incentives. Obviously, these incentives are greatly determined by the amount of damages the liable injurer has to pay. The desired incentives might also be provided by compensation in other forms than money damages, such as the duty to repair damaged property or to demolish an unlawfully built structure (Zervogianni, 2004). However, in this Chapter, only literature regarding money damages will be discussed.

In this Chapter, I will focus on the primary cost reduction, but in Section 17 I will discuss secondary cost reduction. Throughout the whole Chapter, where relevant, remarks on tertiary cost reduction are made.

Even though the economic analysis of tort law in general and the differences between negligence and strict liability in particular will be discussed in detail in other Chapters of this Encyclopedia, it is useful to provide a short summary of these insights at this point, in as far as they are relevant for the topic of tort damages.

In engaging in activities, people create externalities, *i.e.* a probability for others to suffer losses as a result of this activity. Tort law is regarded as an instrument that can provide behavioral incentives to the actors, so that they internalize these externalities. In other words, due to the threat of being held liable, actors incorporate the possible losses of others in their decision on how much care to take, and how often to engage in the activity. By taking more care and/or by reducing his activity level, the actor can lower the probability of an accident, and thereby the expected accident losses. Optimal care and optimal activity are taken when the marginal benefits of taking more care or further reducing the activity level equal the marginal benefits thereof in the sense of a reduction in the expected accident losses. (see among many others Posner, 1972; Brown, 1973; Shavell, 1980; Polinsky, 1980b; Shavell, 1987; Landes and Posner, 1987; Polinsky, 1989; Cooter and Ulen, 2004; Shavell, 2004; Schäfer and Ott, 2005).

In unilateral accident settings, where only the injurer can influence the accident risks, under a rule of strict liability the injurer is always liable for the losses he has caused, so that he always bears the total accident costs, which consist of the care costs and the expected accident losses. He will choose the level of care which minimizes this sum. This is the optimal care level. Furthermore, because he bears the full total accident costs, he only engages in the activity if it yields him more utility than the full costs. Therefore, he also chooses the correct activity level. Obviously, his decisions should be based on the full social losses caused by his activity, so that in principle, tort damages should lead to full compensation of the losses of the victim.

In addition, the injurer in some cases should bear (part of) the litigation costs of the victim. If the victim would have to bear his own litigation costs, he might decide not to bring suit, so that the injurer is not confronted with all losses he has caused. Furthermore, the litigation costs themselves form social costs, which are caused by the injurer. If allowing only compensatory damages would lead to the situation that the victim will not bring suit due to the litigation costs, it is desirable that the injurer also bears a large enough part of the victim's litigation costs, in order to induce the latter to bring suit in cases where the injurer did not take optimal care. Ideally, in cases where the injurer took optimal care *ex ante*, the victim should not bring suit *ex post*, because this only causes additional (litigation) costs while the injurer already took optimal care.

However, in order for strict liability to be able to provide the correct care incentives to the injurer ex ante, victims should ex ante always be willing and able to bring suit if they are injured. If taking care influences the magnitude of the losses, the optimal outcome is reached if the compensatory damages plus compensation for litigation costs are *higher* than the full litigation costs if the injurer took inadequate care, but *lower* if the injurer took optimal care. After all, the victim will then bring suit if the injurer took too little care, which will induce the injurer to take care, which will bar the victim from bringing suit. Hence, optimal care is taken and no suit is brought. On the other hand, if litigation costs are low enough, victims will bring suit even if the injurer took optimal care. Reducing compensatory damages in such cases to make the suit unattractive avoids these administrative costs, but retains the correct care incentives (Polinsky and Rubinfeld, 1988. Also see Shavell, 1997 and 2004, p. 282ff, Hylton 2002. For empirical research regarding litigation costs, see Hersch and Viscusi, 2007 and Black et al., 2007).

Under a negligence rule, still in unilateral accident settings, the injurer is only liable if he did not take the level of care that he was legally required to take. If courts set this due care level equal to the optimal care level, the injurer is induced to take optimal care. By definition, it is cheaper to take due care and not be liable, than to take lower care and be liable. However, because a non-negligent injurer does not bear the expected accident losses, he essentially externalizes these costs upon the victim and engages in his activity as long as it yields more utility than the costs of due care. His activity level will therefore be too high.

It should be noted that tort damages under a negligence rule do not have to fully compensate the victim, in order to induce the injurer to take due care. As long as the costs of taking due care are lower than the costs of a lower care level plus damages, the injurer will take due care. So, even damages that do not fully compensate harm can provide the correct care incentives, as long as they make taking due care the more attractive strategy. However, Kahan points out that if the court requires a causal relationship between the negligence and the losses, so that the injurer only has to compensate the losses that were caused by the negligent character of his behavior, this difference between strict liability and negligence disappears. Full compensation then is required under negligence as well (Kahan, 1989. Also see Grady, 1983; Grady, 1989; Miceli, 1989).

If courts can make mistakes in determining true care and/or due care, injurers might take excessive care in order to avoid being held liable by mistake p. see e.g. Calfee and Craswell, 1984; Craswell and Calfee, 1986; Cooter and Ulen, 2004, p. 339ff and 364ff; Shavell, 2004, pp. 224ff). Lowering the amount of damages might ameliorate this situation. Again, requiring a causal connection between the negligence and the losses changes this result. Court's mistakes might now lead to inadequate care, so that damages should be supra compensatory to solve the problem (Kahan, 1989).

In bilateral accident settings, where not only the injurer but also the victim can influence the accident probability, the victim should receive incentives to take due care as well. Under a negligence rule, the victim is the residual risk bearer (assuming that the injurer indeed takes due care) and hence he will correctly weigh the costs and benefits of taking additional care himself. However, under strict liability the victim receives no care incentive at all, because the injurer is always liable. A defense of contributory or comparative negligence is needed to provide the victim with such incentives. Irrespective of the rule chosen, it is not possible to provide both actors with the proper activity incentives, because only the residual risk bearer will compare his utility from the activity with the full costs.

In 'bilateral risk' situations, each actor is both a potential tortfeasor and a potential tort victim. Arlen argues that the negligence rule (with or without a defense of contributory negligence) as well as strict liability with a defense of contributory negligence can provide the correct care incentives to all parties. It is always best for each actor to take due care, irrespective of what the other party will do. Damages need not fully compensate the losses, as long as they are high enough to make due care more attractive than being (contributory) negligent. Under pure strict liability, however, neither actor is confronted with the full costs he imposes on the other, because he also expects to receive some damages in return. Hence, neither party takes optimal care (Arlen 1990a, 1990b, 1992a. Also see Wittman et al., 1997). Kim and Feldman argue that Arlen's conclusions change when it is accepted that there is uncertainty about the proportion of total damages each party would suffer from an accident. If parties do not know in advance who will be injured ('role-type uncertainty') and their subjective beliefs about the probability that *they* will be the victim do not add up to unity, pure comparative negligence and the equal division rule have better efficiency properties than other negligence-based rules, because they are independent of the role-types (Kim and Feldman, 2006, p. 466).

Regarding the issue of litigation costs, negligence can provide equally good care incentives as strict liability, but with a lower level of litigation. After all, if due care is set at the optimal level, and injurer that takes optimal care will not be negligent, so that victims will not sue (Polinsky and Rubinfeld, 1988).

2. Full Compensation of Harm?

A plaintiff who wants to sue for damages has to have suffered harm. In economic terms, harm is a downward shift in the victim's utility of profit function (Cooter and Ulen, 2004, p. 311 ff, Schäfer and Ott, 2005, p. 129). The victim can be brought back to the original utility curve by repairing the material damage (or curing the injuries) at the expense of the tortfeasor. If repair is more expensive than replacement, damages should be based on the replacement costs. If repair or replacement is not (completely) possible, the tortfeasor should pay

an amount of money that provides enough utility to bring the plaintiff back to his original utility curve.

As a general starting point, damages should *fully* compensate the victim for his losses, because only then will the injurer internalize the negative externalities that he has caused (Posner, 2003, p. 192; Cooter and Ulen, 2004, pp. 312 ff and pp. 323ff; Shavell, 2004, p. 236). However, as mentioned above, under (contributory) negligence damages need not be full, as long as they make taking due care more attractive than applying a lower care level. Furthermore, to induce victims to optimally mitigate their losses, damages should be restricted to the optimally mitigated losses plus the mitigation costs (Wittman 1981; Shavell, 2004, pp. 248, 249). In addition, costs that the victim would have incurred in any case, should not be compensated (if e.g. the victim's car has to be repaired after an accident, the costs of a rental car should be compensated, but not the costs of gasoline for the rental car). Finally, any benefits the victim might have derived from the tort decrease his net harm and should be deducted from the damages. Otherwise, the victim would profit from the tort, which might provide adverse incentives. Other deviations from the idea of full compensation will be discussed in subsequent sections.

Full compensation implies that the injurer has to compensate the losses of the plaintiff, even if those losses are higher than normal. The principle that 'the injurer takes his victim as he finds him' (also known as the 'thin skull plaintiff rule'), according to which the injurer also has to fully compensate an unusual sensitive plaintiff, therefore makes economic sense. On the contrary, using legal ideas such as foreseeability or adequacy to limit damages to the losses that the injurer could reasonable foresee, leads to inadequate care incentives for the injurer (Shavell, 2004, p. 239).

It takes a certain period of time before a victim who has suffered losses, recovers these losses, due to the time necessary to find the tortfeasor, the duration of the trial or settlement negotiations, *et cetera*. Full compensation requires the injurer to pay interest over this period of time (Shavell, 1987, p. 141). Without such prejudgment interest, the victim would not be fully compensated and the injurer would not be optimally deterred. Furthermore, the latter would have an incentive to delay the procedure (Knoll, 1996a, pp. 296ff). Knoll argues that the interest should be compounded (so, 'interest over interest'), it should correspond to the interest rate that the defendant pays or can pay for unsecured debt and it should be a floating interest rate, because fixed interest rates interfere with the parties' incentives to settle (Knoll, 1996b, pp. 306ff, pp. 317ff. Also see Patell, Weil and Wolfson, 1982).

Damages for lost earnings should be based on the pre-tax wage, because otherwise the tortfeasor does not internalize the full social losses he has caused. However, the victim should only receive compensation of his post-tax wage because that is the amount he has lost. Compensating pre-tax wages could provide adverse incentives to the victim. The desired compensation can be reached by either granting compensation for post-tax wages, or by taxing pre-tax based damages. In the United States, the victim receives untaxed

compensation for pre-tax wages. (Shavell, 1987, pp. 143, 144). Blackburn argues that without this tax exclusion of personal injury damages, fewer plaintiffs would be willing to settle their case. However, not all forms of personal injury damages should be excluded. E.g. interest received over deferred payment should be taxed, as should injuries to business reputation, economic losses (e.g. lost wages) and punitive damages (Blackburn, 1989, pp. 689ff. Also see Brooks, 1988 and Dodge, 1992).

Cooter and Porat argue that nonlegal sanctions such as loss of reputation should be deducted from damages to provide better incentives. These non-legal sanctions do not only harm the wrongdoer, they also benefit other persons, e.g. by informing them about the wrongdoer or by transferring (part of) the wrongdoer's business to them. These benefits form positive externalities, which the wrongdoer cannot internalize. If they are not deducted from the damages, unintentional wrongdoing is over-deterred. The compensation goal, which is undermined, should not be aimed for by tort law, but by private insurance (Cooter and Porat, 2001).

Van Wijck and Winters analyze an alternative interpretation of 'full compensation'. If the injurer would have taken due care, the victim would have faced a certain amount of expected harm. Full compensation after a tort has been committed should bring the victim back to this position, not to the position where he suffers no harm at all. Hence, the injurer does not compensate the victim for losses that he would have suffered if the injurer would have taken due care. This alternative rule provides better care incentives than the regular negligence rule, which in essence was already argued by Kahan (1989), but inferior activity incentives (Van Wijck and Winters, 2001). Singh further analyzes this rule in a bilateral setting and it appears that the alternative rule is not always superior then. In particular, if the courts set the due care level of the injurer too high, it depends on the behavior of the victim whether the injurer will take optimal care (Singh, 2004, p. 231). Furthermore, if the expected liability payments of the injurer are lower than the actual harm he has caused (e.g. the damages are set too low or the injurer sometimes escapes the trial), the injurer might decide to take inadequate care, because he only bears a fraction of the increase in expected accident losses caused by his negligence. The traditional negligence rule could still have provided adequate care incentives in such situations (Singh, 2004, pp. 232ff).

3. Pecuniary and Nonpecuniary Losses

Pecuniary losses are either monetary losses or losses of replaceable goods, where the replacement costs are a good measure of the losses. Nonpecuniary losses consist of damage to irreplaceable things such as family portraits, but also health and emotional well-being (Shavell, 1987, p. 133; Shavell, 2004, p. 242).

For pecuniary losses, the concept of full compensation is relevant, because damages can make the victim indifferent between the situation without the tort on the one hand, and the situation with the tort and with damages on the other hand. For nonpecuniary losses, the idea of indifference often is useless, because money cannot compensate the loss (Cooter and Ulen, 2004, pp. 368, 369).

In order to provide the correct incentives to the injurer, tort damages should equal the sum of pecuniary and nonpecuniary losses (Faure, 2002a, p. 121; Shavell, 2004, p. 242). It is therefore necessary that courts make an assessment of both pecuniary and nonpecuniary losses. See further Sections 4 and 6 below.

4. Assessment of Losses

Both pecuniary and nonpecuniary losses lower the utility of the victim. Assessing these losses entails costs, and the higher these 'assessment costs', the more difficult it is to make a good assessment (Polinsky, 1980a, p. 1079; Krier and Schwab, 1995, pp. 453ff. For an analysis of the efficiency of liability rules when courts miss-assess the damage, see Singh, 2003). In assessing the losses, a more objective or a more subjective approach can be followed. The subjective, concrete approach assesses the loss in the case at hand, so the actual loss that was suffered. The objective, abstract approach on the contrary disregards many specifics of the case and assesses how large the losses generally speaking would be in comparable situations.

The abstract method is more efficient than the concrete method, in the sense that it is less expensive to administer. In suitable cases, such as often occurring damages to goods, it leads to good results. E.g. if a car is damaged, the costs of repair by a competent mechanic are a good assessment of the losses, even if in a specific case the victim can repair the car himself or if he does not have the car repaired at all. The reduction in tertiary costs outweighs the possibility that the behavioral incentives are not perfectly fine-tuned. This problem could e.g. consist of a victim profiting from the money damages, because his subjective valuation of the damaged good was lower than its market price (Zervogianni, 2004, p. 529).

It remains to be seen if a more accurate assessment of the losses provides better incentives. After all, if the injurer cannot ex ante assess how many losses he will cause, a better assessment ex post does not change his behavior. As long as the assessment of the losses is correct on average, the injurer receives the correct incentives (Kaplow and Shavell, 1996; Kaplow and Shavell, 2002, pp. 265 ff).

If the losses are systematically overestimated, it is generally argued that the injurer will take excessive care and will choose a too low activity level, and vice versa. Nussim and Tabbach argue that this result might change if one relaxes the assumptions of the standard model that the costs of care and the expected harm are proportional to the activity level. The existence of durable precautionary measures (which may be effective or endure for all, or at least

more than one activity level) forms a reason to relax these assumptions. Learning effects and fatigue are other reasons to question the proportional ratio between care costs and activity level. Furthermore, marginal expected harm might not be linear to the activity level, think about e.g. exposure to toxics. An overestimation of losses that is unrelated to activity level or actual harm leads to an increase in care level. Due to the interdependency of care and activity level, it might now be optimal for the injurer to increase his activity level as well, instead of reducing it. Alternatively, an overestimation of losses caused by an overestimation of the activity level induces the injurer to reduce his activity level. This might reduce care through complementarity instead of increasing it (Nussim and Tabbach, 2006, pp. 17ff).

Pecuniary losses are relatively easy to assess, because they equal a money loss, costs of repair or cost of replacement. Nonpecuniary losses are much more difficult to assess, because they cannot be observed directly (Shavell, 2004, p. 242). This opens possibilities of strategic behavior. It is therefore suggested that nonpecuniary losses should not be compensated at all when they are likely to be small, or to use simple tables or formulas to determine damages. However, if nonpecuniary losses are large, in order to provide adequate incentives, more efforts should be spent on trying to make a better assessment. Damages for fatal accidents are an important example of such situations.

5. Damages for Fatal Accidents

5.1 Introduction

In many jurisdictions, if the victim of a tort dies, his surviving relatives are entitled to receive compensation for the funeral costs, and for their loss of maintenance, in as far as they (still) depended on the deceased. Hence, the financial losses caused by the fatal tort are compensated. The nonpecuniary losses of the relatives, however, are often not or not fully compensated (Magnus, 2001, p. 210).

Moreover, the loss of the life of the deceased himself is not compensated. From an economic point of view, this leads to underdeterrence (Arlen, 1985). This raises the question of what damages would provide correct behavioral incentives to the injurer. In Section 5.2, literature regarding the optimal amount that the injurer should pay is discussed. Section 5.3 focuses on the optimal amount that the victim (or better, his surviving relatives) should receive.

5.2 Optimal amount that injurers should pay

In order to let the injurer fully internalize the losses he has caused in a fatal accident, it is necessary to try to estimate the value of a human life. Extensive literature regarding the so-called *value of a statistical life (VSL)* exists.

This VSL is derived from all kinds of decisions that individuals take and which affect health and safety. Examples are installing an airbag in a car, using

seatbelts, installing a smoke detector, buying dangerous products, accepting dangerous work conditions, *et cetera*. Such market choices contain an implicit tradeoff between money and risks, and these tradeoffs are used to estimate the VSL. If a person decides to install an airbag because it reduces the chance of being involved in a fatal accident, this person apparently values the decrease in risk higher than the price he has to pay. By analyzing many of such decisions, a VSL can be determined.

This VSL should not be regarded as a universal constant, or a 'correct amount' indicating the true value of a human life. It is rather the trade-off that results from a given research. It is therefore not possible to use a VSL from e.g. labor research for another labor situation or a non-labor setting just like that. Different populations have different risk preferences and safety valuations (Viscusi and Aldy, 2002, p. 23). Most American labor-related research results in a VSL of between \$3.8 and \$9.0 million and according to Sunstein, the VSL is currently set at about \$6.1 million (Sunstein, 2003, pp. 2 and 3; Sunstein and Posner, 2004, p. 21). Non-labor research (e.g. regarding buying and using smoke detectors, bicycle helmets, cigarettes or the way in which the price of houses responds to dangerous waste dumps in the area) results in comparable, albeit somewhat lower amounts. The American VSL is comparable to the VSL found in other developed countries, but higher than in developing countries (Viscusi and Aldy, 2002, pp. 29, 38 and 67).

The *Value of a Statistical Life Year (VSLY)* makes it possible to distinguish on the basis of age of the potential victim(s). A saved young life is worth more in the sense that more life years are saved than with an elderly person. An activity that especially endangers young persons causes more expected accident losses than an activity that mostly endangers older people (Sunstein, 2003, p. 2). Optimal damages therefore should be higher in the first case, in order to provide the correct care and activity incentives.

Posner and Sunstein conclude that damages for fatal accidents, if based on the VSL(Y), should be around \$6 million or higher. This is far more than the current legal standard of loss of income of the surviving relatives and funeral costs. Moreover, they also argue that the damages should be increased by the emotional losses of the surviving relatives, which could amount to several millions of dollars as well (Posner and Sunstein, 2004, pp. 48, 52).

In the field of health economics, the concept of *Quality Adjusted Life Years* (QALY's) is used to assess the benefits of healthcare measures. It is a measure of the value of living one year under a certain health condition, where '0' denotes death and '1' perfect health.

It is interesting to think about the possibilities of applying QALY's in the field of tort damages, both for fatal accidents as for accidents with personal injuries. In order to be able to do so, a money value has to be attached to the QALY. The available attempts to monetize the QALY have led to very different outcomes. The American Food and Drug Administration (FDA) has used figures ranging from \$100,000 to \$500,000 per QALY (Adler, 2006). The British National Institute for Clinical Excellence (NICE) uses figures of

£20,000-30,000 (\$40,000-\$60,000), although Devlin and Parkin argue that these figures should be a bit higher (Devlin and Parkin, 2004, p. 450). Finally, the figure of \$50,000 is mentioned as a lower boundary for a QALY, given that this is the cost of a year kidney dialysis, which is a treatment that is considered worthwhile (Weinstein, 2005, pp. 5, 6; Ashenfelter, 2006, p. 10). Weinstein provides an overview of the number of QALY's that can be gained per million dollars when applying different medical interventions, ranging from under ten to over 200 (Weinstein, 2005, p. 5).

If future research would result in a commonly accepted (minimum) monetary value of a QALY, this value might be used to calculate damages in fatal accidents or tort cases with personal injuries. Suppose that a QALY would be monetized at \$100,000. In a given accident, the victim is killed. If his pre-accident health would be for example 0.8 (so he was not in perfect health) and if according to life expectancy statistics his remaining life expectancy was 20 years, tort damages for the loss of life would amount to $\$100,000 \times 20 \text{ years} \times 0.8$, so \$1.6 million. Analogously, if this person would suffer personal injuries which are valued at 0.1 QALY and which would last for two years, damages would amount to \$20,000. However, much research is needed before QALY's can be utilized in this way. In this research, attention also has to be spent to the insight that people adapt to injuries more rapidly than is commonly thought, so that the damages for pain and suffering might have to be adjusted downward (Sunstein, 2007; Adler and Posner, 2007; Bagenstos and Schlanger, 2007).

5.3 Optimal amount that the surviving relatives should receive

The prevention goal of tort law implies that injurers should pay damages, but not necessarily that victims should receive those damages. Especially in cases of fatal accidents where damages are based on VSL, VSLY or QALY, it remains to be seen if the surviving relatives should receive this large amount. After all, these measures are used to assess the loss that was caused by the fatality, *i.e.* the loss of life of the deceased. Paying this amount of money to the surviving relatives does not serve the deterrence goals, but would only cause administrative costs. It is even possible that the prospect of receiving millions of dollars might cause moral hazard issues on the side of the relatives, which forms another reason not to award these high damages to them.

As mentioned above, according to Posner and Sunstein, the tortfeasor should also pay for the emotional losses of the relatives. These are indeed true losses that he has caused, and full internalization of externalities requires that he pays for these costs as well. Whether or not the relatives should receive compensation for this type of losses will be discussed in section 6 below, on compensation for nonpecuniary losses.

6. Compensation for Nonpecuniary Losses?

In previous sections it already became clear that tortfeasors should in principle *pay* damages that include nonpecuniary losses in order to receive the correct behavioral incentives. Only if these losses are small, it is better to disregard them in order to save on the administrative costs of assessing them.

In the literature, it is however argued that the victim should not *receive* compensation for nonpecuniary losses. In this line of reasoning, the amount of damages that the victim should receive is determined by the amount of losses against which a rational individual would purchase insurance. It is well known that a rational risk-averse individual will purchase insurance against *pecuniary* loss. After all, the pecuniary loss has lowered his welfare. Due to the decreasing marginal utility of wealth, the marginal utility of an additional euro is higher in the post-accident state than in the pre-accident state. The individual therefore would like to transfer money from the pre-accident stage to the post-accident stage. This is done by the insurance contract. The utility that is lost in the pre-accident stage by paying the insurance premium is more than outweighed by the expected utility yielded by the insurance coverage.

However, a *nonpecuniary* loss generally does not increase the marginal utility of wealth (Friedman, 1982, pp. 82 ff; Adams, 1989, p. 215; Cooter, 1989a, p. 293; Friedman, 2000, pp. 95 ff; Shavell, 2004, pp. 270 ff). It remains the same, or might even decrease. In the latter case, e.g. where the victim dies or becomes comatose, the victim would even prefer a 'reversed insurance' with which he could transfer money from the post-accident stage to the pre-accident stage, so a market in unmatured tort claims (Shukaitis, 1987; Cooter, 1989a). Because the marginal utility of money does not increase after the accident, a rational individual is not willing to buy an insurance against nonpecuniary losses. The premium would cost more utility than the expected insurance coverage would yield (Shavell, 1987, p. 229). An alternative to insurance could be formed by the idea of *ex ante* compensation, where potential victims are compensated for the risks imposed upon them, before and irrespective of any harm occurring to them. However, such a system would probably be unworkable, because many risks have to be calculated and countless transactions have to be executed (Friedman, 1982; Graham and Peirce, 1984; Fraser, 1984; Friedman, 2000, pp. 95ff).

The above line of reasoning implies that victims should not receive compensation for nonpecuniary losses, because they would not self-insure against such losses. Croley and Hanson however argue that compensation for nonpecuniary losses makes sense after all. It is true that the marginal utility of wealth does not change due to the nonpecuniary loss. Yet, the whole level of utility, the so-called *baseline utility*, decreases. The money that would be received from insurance against nonpecuniary loss could mitigate this decrease in the utility level. In practice, insurance against nonpecuniary losses is indeed purchased, albeit under different names (e.g. life insurance on the life of a child). In cases where such insurances are not bought, according to Croley and

Hanson the reason for this is not that there is no need for them. It is rather a lack of information or legal restrictions that keep people from purchasing such insurance (Croley and Hanson, 1995, pp. 1845 ff).

In as far as a rational individual would not self-insure against nonpecuniary losses, incorporating these losses in the damages that the tortfeasor has to pay can lead to a sort of 'forced' insurance. For example, if products liability damages include nonpecuniary losses, the price of the products will reflect these losses and the consumer in fact is forced to insure himself through the higher price (Priest, 1987, pp. 1535ff).

A different argument for not compensating nonpecuniary losses is provided by Adams. He argues that not compensating these losses provides the victim with care incentives, even in cases where a defense of comparative or contributory negligence is not able to do so, e.g. because not taking a certain care measure is not regarded as a fault of the victim (Adams, 1989, p. 215). In unilateral accidents or accidents where most or all of the losses are nonpecuniary however, they should be incorporated in the damages in order to provide adequate incentives to the tortfeasor (Adams, 1989, p. 217). The problem with Adam's line of reasoning is that it would provide inadequate incentives to the tortfeasor if he does not have to pay for the nonpecuniary losses he has caused. It is, however, an additional argument that supports the claim from the insurance theory that the victim should not receive compensation for these losses.

The above implies that the amount of damages that the injurer should pay is not the same as the amount of damages that the victim should receive. In other words, liability should be *decoupled* from compensation (Danzon 1984; Shavell, 1987, pp. 231 ff; Polinsky and Che, 1991; Geistfeld, 1995, pp. 799 ff. However, Choi and Sanchirico, 2004 argue that this conclusion does not always hold). This result can be reached by letting the injurer pay a fine on top of the damages he pays to the victim. Also taxing compensatory damages leads to a situation where the amount that the injurer pays exceeds the amount the victim receives. Rubinfeld argues that the costs the victim incurs in order to receive compensation, such as litigation costs and attorney's fees, also causes a divergence between the amount the injurer pays and the amount the victim receives (Rubinfeld, 1984).

7. Uncompensated Losses

Law and Economics scholars argue that in bilateral accident settings, injurers as well as victims should receive behavioral incentives. Both the negligence rule and strict liability with a defense of contributory or comparative negligence are able to provide these incentives. It follows that Law and Economics arguments

are opposing introducing strict liability without a defense of contributory or comparative negligence in bilateral settings.

An often-heard response from lawyers to this line of reasoning is that victims, especially in traffic accidents such as between motorists and pedestrians or bicyclists, will behave carefully anyway. Their fear of being involved in an accident, in which they could be injured or even killed, would provide much stronger behavioral incentives than the threat of the defense of contributory or comparative negligence could do. This fear would lead them to want to avoid the accident in any case.

Apart from the anecdotic empirical observations that pedestrians and bicyclists do *not* take all justified care measures to lower the accident probability (e.g. using good lighting, waiting for the traffic light to turn green before crossing, indicating which way to turn with the bicycle and looking over the shoulder before actually taking the turn, *et cetera*), this line of reasoning introduces the concept of *uncompensated losses*. After all, it is argued that a rule of strict liability does not need a defense of contributory or comparative negligence, because the victim receives care incentives from the desire not to be involved in an accident in the first place. This implies that the amount of compensation received after the accident is not enough to make him indifferent between not being involved in an accident on the one hand, and being involved in an accident and receiving compensatory damages on the other hand. Hence, part of his losses remains uncompensated, either because they cannot be fully compensated or because the law does not recognize these losses as compensable.

If the victim does not *receive* full compensation, the injurer does not *pay* full compensation. It can be shown that the problem of uncompensated losses is larger under a rule of strict liability than under a rule of negligence. After all, the injurer only bears a fraction of the losses he has caused. He therefore does not compare his care costs with liability for the full losses, but only for a fraction of the losses. The ‘reward’ for careful behavior is larger under a rule of negligence than under a rule of strict liability. Under the former rule, the injurer escapes liability altogether by being careful, while under the latter rule he only lowers the probability of being held liable. Given that the reward is larger under negligence, the fraction of losses that the injurer has to compensate can be lower to still provide adequate care incentives. The injurer under negligence takes due care as long as the costs of taking due care are lower than the costs of lower care plus the expected liability. Under strict liability he takes due care only as long as the costs of due care plus expected liability at due care are lower than the costs of a lower care level plus the expected losses at that care level. The injurer’s private costs at due care are therefore lower under negligence than under strict liability.

This all implies that if the fraction of losses that is compensated lies below the ‘critical fraction’ of negligence, none of the liability rules provides the correct incentives. If the fraction lies above the critical level of negligence but below the critical level of strict liability, only the negligence rule provides the

correct incentives. If the fraction lies above the critical level of strict liability, both rules provide the correct care incentives. Hence, the argument of uncompensated losses that was introduced to justify strict liability without a defense of contributory or comparative negligence turns out to be an argument against strict liability and in favor of negligence (Visscher 1998). If courts make mistakes in setting the due care level, this advantage of negligence might disappear. That result comes as no surprise, given the insights from economic literature regarding the comparison of negligence and strict liability (see also the chapter dealing with this distinction in this Encyclopedia).

8. Punitive Damages

Law and Economics literature provides several arguments in favor of punitive damages. (See, among many more, Ellis, 1982; Cooter 1982; Cooter, 1989b; Eisenberg et al., 1997; Polinsky 1997; Polinsky and Shavell, 1998; Karpoff and Lott, 1999; Shavell, 2004, pp. 243 ff; Duggan, 2006, pp. 308ff). The topic of punitive damages will be elaborated upon in a specific chapter in this Encyclopedia, but at this point, a brief overview of the abovementioned arguments will be given.

First and foremost, punitive damages can be used to offset the problems caused by the fact that the probability that a tortfeasor will actually be held liable is below 100%. The victim might not start a lawsuit and if he does, he might not be able to prove fault (if required), causation or losses. Courts might make mistakes in setting the due care level or in determining the true care level. If tortfeasors are not held liable in all situations where they should be liable, their expected liability is lower than the losses they have caused. This could provide inadequate care incentives and could lead to excessive activity levels. A possible solution to this problem is to multiply the damages by the reciprocal of the probability that the injurer will be found liable in the suitable cases. So, if this probability is e.g. 50%, damages should be doubled in order to provide the correct incentives (Cooter, 1989; Polinsky and Shavell, 1998; Shavell, 2004, p. 244). Hylton and Miceli argue that the multiplier should be set by striking a balance between the problem of the too low probability of being held liable on the one hand, and the desire to optimize litigation costs on the other hand. This leads to a lower optimal multiplier (Hylton and Miceli, 2005. Also see Yun, 2004). In situations where victims do not start a lawsuit because their losses are lower than the costs of filing a claim, besides awarding punitive damages allowing collective actions might solve this problem of 'rational apathy' (see e.g. Schäfer, 2000, pp. 184ff and Van Aaken, 2003, pp. 55ff).

Second, the injurer might derive social illicit utility from causing harm. This implies that society wants to discourage this harmful act and in order to do so, damages must exceed the utility the injurer derives from his act. If the injurer's utility exceeds the harm, damages have to be supra compensatory. The same holds if taking care causes special disutility for the injurer which is not

considered relevant for social welfare (Shavell, 2004, p. 245). Friedman objects to such a line of reasoning. Ignoring certain benefits by labeling them as illicit assumes the conclusion of undesirability instead of proving it (Friedman, 2000, pp. 229 ff).

Third, in situations where a potential tortfeasor is able to negotiate with a potential victim about the price to pay for his activity, it is often preferred that he does so. Market transactions are preferred over the forced transactions through tort law, *i.a.* because of the possibility that damages do not cover all losses. E.g. subjective valuations are difficult to assess and tort damages might not encompass all losses. Punitive damages encourage the market transactions, because committing the tort becomes more expensive (Shavell, 2004, pp. 245, 246).

Finally, victims who claim damages in essence serve the social goal of deterrence. However, starting a lawsuit entails costs, which are privately borne. This might lead to too little lawsuits being brought. Increasing the expected damages of victims by awarding punitive damages might ameliorate this situation.

Victims receiving supra compensatory damages might start behaving strategically in order to increase the chances of being involved in an accident where they can claim these damages. The problem of taking inadequate care might be tackled by incorporating a defense of contributory negligence. Victims however might also choose an excessive activity level. Decoupling liability so that victims only receive compensatory damages in the first place can solve this problem.

9. Pure Economic Loss

In order to provide actors with the correct incentives to prevent losses, damages should be based on the social losses caused by the actors. In cases of pure economic loss, the private losses of the victim often exceed the social losses. The private losses of the victim might be (partially) offset by private gains elsewhere, so that there is no loss of wealth, but rather a redistribution. If e.g. firm A cannot produce because a power cable was negligently damaged, firm B might be able to produce and sell more products which are substitutes for the products of firm A. In the Law and Economics literature, this is regarded as an important reason not to compensate pure economic loss (Bishop, 1982; Shavell, 1987, pp. 135 ff; Landes and Posner, 1987, pp. 251 ff; Gómez and Ruiz, 2004; Schäfer and Ott, 2005, p. 301; Dari-Mattiacci and Schäfer, 2007, p. 10).

However, it cannot always be argued that in cases of pure economic loss, no social losses occur. First, the products of firm B might not be perfect substitutes, so that consumers suffer a loss of consumer surplus. This problem occurs even more in cases of services rather than products (Schäfer and Ott, 2005, p. 306).

Second, in order for firm B to be able to satisfy the increased demand, there has to be overcapacity, which in itself is inefficient. After all, only if firm B has overcapacity it can increase its production to meet the additional demand of customers from firm A. Resources which are kept as overcapacity do not yield the highest possible return, because if the overcapacity is not utilized after all, the resources remain idle. Not compensating pure economic loss leads to less liability and hence more accidents, so that even more overcapacity is needed (Rizzo, 1982b, p. 202). Rizzo argues that compensating pure economic loss through tort law causes high tertiary costs, so that the claims should be channeled through contract law: the party suffering physical losses also sues for pure economic loss of his contractual partners. Firm A and the phone company agree that the latter will compensate the pure economic loss due to the damaged phone line, and that it will sue the tortfeasor both for the physical losses (the damaged phone cables) and the pure economic loss of its customers. Instead of compensating A for the actual pure economic loss, it is also possible to agree upon *ex ante* compensation through the contract, *i.e.* a lower price for the phone services (Rizzo, 1982a, pp. 291 ff; Gómez and Ruiz, 2004). According to Schäfer, compensation through tort law *is* possible. The extent of the pure economic loss is determined by the amount the excess resource could have yielded elsewhere (Schäfer, 2001a, p. 11).

Third, in cases where the pure economic loss is suffered e.g. because an accountant has negligently approved the balance sheet of a firm so that people buying the stock might have paid a too high price, there will not only be a redistribution of wealth between buyers and sellers of stock. There will also be social loss due to a decrease in trust in the information provided by accountants. Moreover, money is sub-optimally invested on the basis of incorrect information, which entails a social loss as well (Schäfer, 2001b, p. 7).

In situations where on the basis of a contract a risk is allocated to one of the contract parties and this risk can be influenced by a potential tortfeasor, liability for pure economic loss might make sense because it resembles subrogation (Gómez and Ruiz, 2004). If e.g. an employer has to continue to pay wages of an employee who was injured in a tort and temporarily cannot work, the employer suffers pure economic loss. The employer in a sense acts as insurer of this risk of the employee. Without the contractual obligation to pay the wages, the employee himself could have sued the tortfeasor for loss of income. The mere fact that the labor contract has transferred this risk to the employer should not lead to the situation that the tortfeasor is not liable for these losses anymore.

Furthermore, tort liability for pure economic loss might serve as a surrogate for contractual liability. If a third party suffers pure economic loss as a result of a breach of contract, this third party cannot sue on the basis of the contract. Neither can the contracting partner, because he does not suffer the losses. Tort liability can solve this problem. For example, a public notary is negligent in drafting a will, so that an intended beneficiary does not become a beneficiary after all. There is a social loss (the last will of the deceased is not properly

executed), but the intended beneficiary cannot sue out of contract. If he can sue the public notary for his pure economic loss out of torts, this problem could be solved (Gómez and Ruiz, 2004). However, it remains to be seen what the proper amount of damages would be. The amount of money that the intended beneficiary did not inherit is not necessarily connected to the social loss of the last will not being properly executed.

Finally, Dari-Mattiacci argues that the true problem of pure economic loss is caused by the fact that the activity of the injurer causes both negative and positive externalities. Simply adding those does not provide actors with the correct incentives. Dari-Mattiacci does not view overcapacity as inefficient, but as a care measure that parties can take to avoid or lower the pure economic loss. Injurers should receive correct care and activity incentives, while victims and third parties should get the incentive to maintain optimal overcapacity. In order to reach this, liability has to be decoupled: the injurer is liable for the pure economic loss but is compensated for the benefits of third parties, the victim is not compensated for pure economic loss but is compensated for benefits of third parties, and the third parties are allowed to keep their benefits. No traditional tort rule can reach this result (Dari-Mattiacci, 2004).

10. Harm to the Victim or Gain to the Injurer?

Wittman has asked the question if compensation should be based on the cost to one side or benefit to the other side. He focuses on which party – in a situation of information asymmetry - should decide on how much care the injurer should take. The side with the comparative advantage in information about the other side's costs and benefits from taking care should make the decision (Wittman, 1985, pp. 176, 177).

Polinsky and Shavell analyze whether liability should be based on the harm the injurer has inflicted upon the victim, or on the gains that the injurer derived from the tort. They argue that the harm of the victim is the better measure. After all, if damages are based on the gain to the injurer but the court underestimates these gains, the incentives for the injurer are inadequate. As long as he expects a part of his gain to remain after paying damages, he benefits from committing the tort, irrespective of the size of the losses of the victim (Polinsky and Shavell, 1994, pp. 431, 434). Hence, even though the prevention goal of tort law is regarded as an argument to base damages on profits to secure that wrongdoing is not more profitable than law abiding behavior (Magnus, 2001, p. 187), due to the risk of underestimation of profits it is better to base the damages on the losses of the victim.

In some jurisdictions, the victim can ask the court to estimate the damages on the basis of (part of) the profits of the injurer. The problem mentioned by Polinsky and Shavell does not occur here, because if the losses of the victim exceed the profits of the injurer, the victim will not ask to base the damages on the profits in the first place. However, if the profits exceed the costs to the

victim, the act of the injurer could actually increase social welfare. If the victim can collect the full profits, the injurer might refrain from the activity so that the activity level is too low. Alternatively, the injurer might take excessive care to avoid liability. On the other hand, in cases where liability based on the losses of the victim provides inadequate incentives (e.g. due to a too low probability of being held liable), using the profits as standard for damages might solve the problem. Also, if it is difficult for the victim to prove the losses, basing damages on profits avoids the problem of a too low threat of liability. Especially in cases of infringements upon intellectual property this approach makes sense, because the infringer could have sought a voluntary transaction. Determining the damages on the basis of the profits induces the tortfeasor to actually do this (Schäfer and Ott, 2005, pp. 253, 254). In essence, basing tort damages on the profits of the injurer induces the latter to make use of a contract instead.

11. Future Losses

What is the proper form of damages for future losses: lump sum or periodic contingent payments? Traditional arguments for periodic contingent payments are the uncertain nature of future losses, the resulting future risk the victim faces with a lump-sum award and the possibility the victim might misallocate lump-sum awards (Rea, 1981, p. 132).

Rea proposes several reasons why a lump-sum payment might be preferred. First, the victim that prefers a periodic payment can transfer his lump-sum payment into a periodic payment himself. He can use the lump-sum payment to buy insurance (if available) against the risk of a wrong assessment of the losses. With periodic contingent payments, the court has to administer the payments, while with insurance a private insurer would administer them. Courts are not well suited for this task.

Second, periodic contingent payments form an uncertainty for the defendant. If he is risk-averse, he might want to buy an insurance, which adds to the costs of this form of damages.

Third, periodic contingent payments might lead to moral hazard at the side of the plaintiff. If the payments e.g. consist of the difference between the wage he could have earned without the tort and the wage he actually earns now, he has no incentive to earn more, because this only reduces the damage payment.

Finally, periodic contingent payments cause additional costs for the plaintiff during a much longer time period, e.g. a loss in privacy due to the monitoring which is necessary to determine the extent of the losses.

Obviously, the injurer should only pay the present value of the losses, so they should be discounted for the interest rate (Shavell, 1987, p. 141).

In an empirical study regarding damages for loss of future earnings in England and Wales, it is argued that courts have generally undercompensated the

victims. Important reasons are the fact that courts underestimate the growth in earnings over a claimant's working life, as well as the adverse effects of residual disability on post-injury employment. In American cases, more attention is spent to results of labor market analysis to predict future patterns of earnings and employment (Lewis et al., 2002, pp. 408, 414). According to the authors, because courts in England and Wales do not incorporate those insights, 88% of the cases in their survey were undercompensated. Over half of those claimants would have received at least 50% more, and a third of them at least 100% more. The differential is most significant for men, younger claimants and victims with post-injury earnings potential (Lewis et al., 2002, p. 433).

12. Role of Defendants' Wealth

Should the wealth of the defendant influence the damages he has to pay? After all, the duty to pay a given amount of damages weighs more heavily on the utility level of a poorer defendant than on the utility level of a wealthier defendant.

In the standard analysis, injurers are assumed to be identical and risk neutral, so that the issue plays no role there (Abraham and Jeffries, 1989; Arlen, 1992b. Also see Miceli and Segerson, 1995). However, if parties are risk averse and the goal is to maximize total social welfare, measured as the sum of individual utility levels, the result changes. The optimal care level rises as the defendant is wealthier. After all, spending an additional euro on care costs him less utility than it would a less wealthy person. In order to induce the wealthier person to take more care, damages should be raised for him. Hence, the optimal level of damages would depend on the wealth of the defendant. Arlen argues that this conclusion might be rejected, because it might reduce the incentive to accumulate wealth, and it raises the administrative costs (Arlen, 1992b).

Furthermore, it is commonly argued that tort law is not the best instrument to redistribute wealth (Polinsky, 1989, p. 10; Kaplow and Shavell, 1994; Kaplow and Shavell, 2000; Weisbach, 2002). The basic argument is that any tax on income, whether imposed directly as income tax or indirectly via the legal system, distorts the work incentives in the sense that people will work less than without taxes in the same way. However, use of the legal system also distorts the underlying activity being regulated (Avraham et al., 2002, p. 4). Therefore, legal rules should only focus on efficiency, not on redistribution. Avraham et al. argue, referring to work of Sanchirico, that introducing heterogeneity with regards to the skill in taking care and with regard to the ability to generate income and relaxing the assumption that the social planner has complete information challenges this conclusion (Avraham et al., 2002, p. 6; Sanchirico 2000; Sanchirico 2001). Income-dependent tort rules enable wealthy defendants to lower their expected liability in two ways: taking more care and/or working less. Income-independent tort law only provides the option of taking more care. Because people differ in their skill to take care and to acquire income, there is

no simple way to determine this mix for every individual, so that the conclusion of Kaplow and Shavell that income-dependant tort law leads to excessive care of wealthy defendants and inadequate care of poor defendants is rejected. Fine-tuning the tax system to the characteristics of every individual so that their conclusion would still hold requires too much information from the social planner (Avraham et al., 2002, pp. 7ff).

13. Mitigation of Losses

As already indicated in section 2, victims should be induced to optimally mitigate their losses, so that damages should be restricted to the optimally mitigated losses plus the mitigation costs (Wittman 1981; Shavell, 2004, pp. 248ff). This way, the victim is induced to take these optimal measures. After all, not taking these measures leads to higher losses that are not fully compensated, and taking more than the optimal measures increases the costs, but not the damages. The injurer is confronted with the costs (both of the losses and the mitigation measures) he has caused, which are minimized due to the mitigating measures.

In legal literature the question has arisen whether the costs of keeping reserve equipment available in case an accident happens can be (partly) recouped from the liable injurer. If e.g. a bus company keeps a spare bus available to be able to quickly replace a bus that was involved in an accident, it avoids having to commercially rent a replacing bus. Legal problems with this topic are the fact that the costs of the spare bus have been made prior to and unrelated to the accident. After all, if there had not been an accident, the costs of the spare bus would have been the same. Hence, the causal link between the accident and these costs is problematic. Furthermore, it is difficult to determine which part of the costs should be borne by the injurer. From an economic point of view, the costs of the spare bus, if it is kept in consideration of possible accidents and if this is cheaper than renting replacing buses after accidents have happened, should be regarded as mitigation costs that should be compensated by the injurer. It is irrelevant that the costs were already made before any accident. If the bus company cannot recoup these costs, it will be induced to have too little spare material available, because the costs of renting a replacing bus are regarded as losses that the injurer has to compensate. The decision how much spare material to keep will then only been taken on the basis of how often buses break down due to factors for which no one can be held liable. Furthermore, the injurer would not internalize all losses he has caused.

Optimal mitigation costs should be compensated by the injurer, care costs should be borne by the actor himself. It can be difficult to distinguish between both types of costs, especially if both types of measures are already taken before the accident. Many economic analyses regard the size of the losses as fixed, so that care only influences the accident probability. The distinction between care measures and mitigation measures is then easy: care measures

lower the accident probability; mitigation measures restrict the size of the losses after an accident has happened. However, some measures that reduce the size of the losses are not regarded as compensable mitigation measures, such as wearing a seat belt, so that the above distinction does not suffice. A possible distinction might be made as follows: measures that reduce the probability of an accident in general are care measures. They should not be compensated because that would only imply a transfer of money, without lowering the total accident costs. Measures that lower the size of the losses can be both care measures or mitigation measures. If they limit the size of the losses *at the time of the accident*, they should be regarded as uncompensable care measures, such as wearing a seatbelt or having an airbag installed. Measures that limit the size of the losses *after the initial losses have materialized* on the other hand, such as using a fire extinguisher after an accident, are mitigation measures and should be compensated in as far as they have reduced the total accident costs.

14. Judicial moderation, limitation of damages and insolvency

Courts often have the authority to moderate damages, if full compensation is regarded as a too heavy burden on the tortfeasor in the given circumstances, e.g. because minor mistakes can lead to enormous losses in the modern society and because strict liability can make someone liable without having done anything wrong. Furthermore, statutes might limit the maximum amount of damages, e.g. to the amount that could reasonably be insured.

Given the economic point of departure of full compensation, both restrictions of liability are debated. The argument of uninsurability that is often invoked fails to recognize that it is not primarily the size of the losses, but rather the uncertainty regarding the accident probability that causes this problem. Restricting liability therefore does not solve the problem, but exactly increases the primary accident costs by lowering the care incentives and increasing the activity level (Jost, 1996, p. 262; Cooter and Ulen, 2004, pp. 358ff; Shavell, 2004, pp. 230ff; Faure, 2005, pp. 251ff; Van den Bergh and Visscher, 2006, pp. 536ff).

Furthermore, it can increase the secondary accident costs by leaving part of the victim's losses uncompensated. On the other hand, the secondary costs might be lowered if the injurer is risk averse and cannot fully insure his losses, because the restricted liability spreads losses that exceed the limit over the injurer and the victim.

The restricted liability might induce a risk-averse injurer to engage in an activity from which he would refrain under full liability. This is positive in situations where the total costs of the activity are lower than the benefits, but where the risk-attitude of the actor inhibits him to engage in the activity. However, if the total costs are higher than the benefits, restricted liability might lead him to engage in the activity where he would have better refrained from it.

Dari-Mattiacci and De Geest analyze the influence of insolvency of the injurer, but argue that their results also hold in other situations where the injurer has caused more losses than he has to compensate, e.g. due to limitation (Dari-Mattiacci and De Geest, 2005, p.38).

The existing literature investigates the influence of judgment proofness in situations where the care level influences the accident probability. The result is that the injurer will take inadequate care, because he weighs his care costs against the limited liability. This problem is more severe under strict liability than under negligence, because taking care under strict liability only reduces expected liability, while under negligence taking due care makes the injurer escape liability altogether. Therefore, taking due care under negligence is worthwhile as long as the expected liability (which is lower than the expected losses, due to the judgment proofness) is higher than the costs of due care (Summers, 1983; Landes and Posner, 1984, pp. 420ff; Shavell, 1986; Shavell, 1987, p. 167; Faure, 2002, pp. 368 and 371. Also see Beard, 1990, who argues that bankruptcy can lead to inadequate, but also to excessive care under strict liability). This difference disappears if a causal relationship between the negligence and the losses is required (Kahan, 1989). A possible solution to the judgment proof problem is to let the injurer pay punitive damages in those cases where harm is lower than his assets, to correct for the cases where he is judgment proof. After all, this increases his expected liability (Boyd and Ingberman, 1994; Lewis and Sappington, 1999). Dari-Mattiacci and De Geest argue that this same result can be achieved by having the injurer pay average damages in each case. The advantage according to them is that this requires less information, because only knowledge about average harm is needed, not about real harm in specific cases (Dari-Mattiacci and De Geest, 2005, pp. 48ff).

Dari-Mattiacci and De Geest label the above model where care influences only the accident probability as the 'probability model'. Besides this model, they distinguish three other models. In the 'magnitude model', care only influences the possible magnitude of the losses. In the 'joint probability-magnitude model', the care measure simultaneously influences the accident probability and the magnitude of the losses. In the 'separate probability-magnitude model', some care measures influence the accident probability while others influence the magnitude of the losses (Dari-Mattiacci and De Geest, 2005, pp. 42ff. Also see Nussim and Tabbach, 2006, pp. 23ff).

The traditional outcome of the probability model that insolvency leads to inadequate care has to be revised in the magnitude model. If care of the injurer influences the magnitude of the losses, the injurer can decide whether or not the harm will exceed his assets (or another threshold). If he decides not to be judgment proof, (he remains in the 'solvent zone') he will take optimal precautions. However, if he decides to be in the 'judgment proof zone', he will choose no care at all, because that does not reduce his liability but would only entail care costs.

In the separate probability-magnitude model, if the injurer chooses optimal magnitude-reducing precautions, he is solvent and hence will also take optimal

probability-reducing precautions. He will do this if the threshold is sufficiently high. If he would choose to take no magnitude-reducing care on the other hand, all probability-reducing care levels are possible and they depend on the threshold. Lower than optimal care is possible due to the familiar judgment proof argument. However, (more than) optimal care is also possible, because by taking no magnitude-reducing care, liability costs *if* an accident happens are higher than optimal. Taking excessive probability-reducing care can mitigate this by lowering the accident probability.

In the joint probability-magnitude model, if the injurer chooses to be in the solvent zone, he will take optimal care. He will do this if the threshold is sufficiently high. If he chooses a lower than optimal care level in order to enter the judgment proof zone, however, he will still take some care measures to lower the accident probability. The lower the threshold, the lower the care level chosen.

In all four models, negligence leads to better results than strict liability. The explanation is that the negligence rule gives an implicit harm subsidy to non-negligent injurers. Judgment proofness, on the other hand, provides an implicit harm subsidy to negligent injurers, which increases with a decreasing care level. Strict liability only has the latter harm subsidy, while negligence has both. Therefore, injurers receive better care incentives under negligence (Dari-Mattiacci and De Geest, 2005, p. 51). Again, if a causal relationship is required between the negligence and the losses, this result will no longer hold (Kahan, 1989).

15. Loss of a chance

In a separate chapter of this Encyclopedia, the topic of uncertainty over causation is discussed. A possible response to this problem is proportional liability, implying that a tortfeasor is held liable if there is a positive probability that he has caused the losses, but the magnitude of liability is reduced by multiplying the losses by the probability of causation.

A closely related topic, relevant for this chapter on tort damages, is called 'loss of a chance', which is especially known in professional liability. It refers to situations where the victim suffers losses because a benefit that could have been yielded with a certain probability has become impossible, or a harm that could have been avoided with a certain probability has materialized (Frasca, 2005, p. 2). For instance, a doctor makes a mistake, the patient suffers harm, this harm could have materialized as well without the mistake, but the mistake has ruined the chance of recovery. The recoverable losses consist of this loss of a chance. So if the patient suffers losses of 100.000 and the chance of recovery without the mistake is established at 25%, damages amount to 25.000.

A problem with uncertainty over causation, and with applying proportional liability, is that it is uncertain whether the tort of the injurer has caused the losses of the victim. In other words, there is only a certain probability that the

tort was the but-for cause of the losses. The doctrine of loss of a chance regards the lost chance in itself as the recoverable loss, and the tort was a necessary cause for this loss. A crucial difference between loss of a chance and proportional liability in cases of mass losses is that in the latter cases statistical data are used to determine the probability that a causal relationship between the tort and the losses exists, while with loss of a chance statistics and probability theory are used to assess the magnitude of the losses, given that it is already established that the injurer is liable for the losses. The fact that one first has to establish that the tort is a but-for cause of the loss of a chance circumvents the danger of proportional liability that liability is based on a coincidental 'relationship' between the activity of the injurer and the losses (see e.g. King, 1981 on the distinction between causation (what was the cause of the loss) and valuation (the process of identifying and measuring the loss that was caused)).

From a deterrence point of view, if a tortfeasor would always escape liability if it is uncertain whether his tort actually caused the losses, he would receive inadequate behavioral incentives. His tort has reduced the victim's probability of recovery or it has reduced the probability of yielding a benefit. If the tortfeasor does not internalize these externalities, his behavior will not be efficient. In essence, the same arguments that can be used to support proportional liability can be applied here. The reader is referred to the chapter dealing with causation for literature on this topic.

It is noteworthy that generally speaking a victim can only claim recovery for loss of a chance if he actually suffered harm (Frasca, 2005, p. 5). This implies that the injurer will not fully internalize the harm he has caused by his tort, because only in cases where harm has materialized he will be held liable, yet only for a fraction of the losses. The fact that in many jurisdictions the defendant is held fully liable if the probability of causation exceeds 50%, so a *preponderance of the evidence* rule (Frasca, 2005, pp. 14ff) ameliorates this problem, yet it might bring back the problem of excessive care incentives which is familiar from the literature on uncertainty over causation (specific with regards to loss of a chance, see Fischer, 2001, pp. 627ff; Kötz and Schäfer, 2003, pp. 239ff).

Goldberg argues that the idea of loss of a chance should not be extended to legal malpractice. Tort law requires harm at the side of the victim. Mere negligence of the injurer (be it a doctor or a lawyer) is not enough. If a tort suit could be based on the mere imposition of risk, instead of on causing harm, several problems would arise. First, courts are not well able to calculate the risks imposed and the money value of the expected harm. Second, there is no good reason to entitle the plaintiff that did not suffer any harm to compensation. Third, law would interfere too much with the freedom of individuals to engage in activities that increase the risk to others (Goldberg, 2003, p. 1207). Goldberg sees no reason why legal malpractice plaintiffs would have more problems of proof regarding causation than other plaintiffs. Furthermore, different than in medical malpractice cases, clients from lawyers are sometimes well able to protect themselves through contracts and monitoring of attorney performance,

e.g. if the client is a firm. Also, in medical malpractice cases, the doctor might have failed to reduce the risk of a fatal disease, illness or condition, while legal malpractice cases are dealing with the right to legal recourse. In addition, the client does not want to be restored to the *status quo ante*, but into a situation that is counterfactual. Finally, the problems of proof differ between medical and legal malpractice claims. All these elements bring Goldberg to the conclusion that the doctrine of loss of a chance, justified as it may be in medical malpractice cases, should not be extended to legal malpractice (Goldberg, 2003, pp. 1210ff).

16. Multiple Tortfeasors

In most cases where multiple tortfeasors are involved, they are jointly and severally liable for the losses, so that the victim is able to sue one (or a few) of them and collect the total damages, which in subsequent recourse claims might be divided over all defendants. The alternative is formed by non-joint liability, where each injurer is only liable for the part of the losses, which can be attributed to him. This topic is discussed in detail in the chapter dealing with joint and several liability, but below the relevant insights regarding damages will be presented.

Under strict liability, solvable injurers receive sub-optimal care incentives under joint and several liability as well as under non-joint liability. After all, each injurer is only confronted with a part of the losses, so that the damages are too low to provide the correct incentives. The injurers will all take inadequate care and externalize the rest of the losses to the other tortfeasors (Kornhauser and Revesz, 1989, pp. 856ff; Kornhauser and Revesz, 1990, p. 637). Only if the tortfeasors operate as a group, they will weigh total care costs against total losses and take optimal care (Shavell, 1987, pp. 164ff). The victim will not sue more defendants than is necessary to receive full compensation, in order to save on litigation costs. Injurers that do not expect to have to pay damages to the victim only receive care incentives through the recourse claims. If recourse is not 100% successful, this implies that some injurers will receive inadequate care incentives, which increases the expected accident losses, which in its turn will increase the care level of the injurers that do expect to be sued by the victim (Tietenberg, 1989, pp. 313ff. Also see Bergkamp, 2000 and 2001 and Faure, 2003b on the possible problems of joint and several liability). Insolvent injurers will take even less care, because they do not focus on the losses they have caused, but on the expected damages, which are lower due to their insolvency. This induces the solvent injurers in the group to take more care, because they expect to have to bear this part of the losses. Under non-joint liability this last shift does not occur. Solvent injurers still take excessive care (although less than under joint and several liability), because the total losses, of which they have to pay a fraction in damages, are higher due to the uncaredful behavior of the insolvent injurers. If all injurers are insolvent, the degree of

insolvency determines which rule provides the best behavioral incentives (Kornhauser and Revesz, 1990, pp. 640ff).

Under negligence where due care is put at the optimal care level, joint and several liability can contribute to deterrence of solvent injurers. After all, the reduction in care costs due to taking less care is always lower than the liability that is created by his negligence (Landes and Posner, 1980, pp. 523ff; Shavell, 1987, pp. 164ff; Kornhauser and Revesz, 1989, pp. 847ff; Tietenberg, 1989, p. 311; Kornhauser and Revesz, 1990, p. 644). Non-joint liability causes care problems if a negligent injurer does not bear the full increase in expected accident losses caused by his negligence himself (Kornhauser and Revesz, 1989, pp. 849ff; Kornhauser and Revesz, 1998, p. 372). If injurers are insolvent, the same problems as with strict liability occur (Kornhauser and Revesz, 1990, p. 645).

Cooter and Porat propose to hold every injurer liable for the total 'excessive harm', *i.e.* the amount in which the actual total harm exceeds the optimal total harm. It is often easier to establish total harm than to prove the harm that each individual injurer has caused. If each injurer is liable for the total excessive harm, each injurer has the incentive not to cause excessive harm. Liability will then be zero, and no injurer has the incentive to deviate from this strategy. Is an injurer would take inadequate care by mistake, the other injurers gain from helping him to correct this mistake (Cooter and Porat, 2007, pp. 67ff). If the authorities underestimate social harm by a certain amount, injurers will take inadequate care. If the authorities overestimate social harm by a certain amount, injurers will still take optimal decisions, because that minimizes their costs. If the error is not additive, but multiplicative, marginal values change and the conclusions might change. Especially if the number of injurers becomes very large, the rule of total liability for excessive harm is not practical anymore, because the possibility is high that mistakes will be made (Cooter and Porat, 2007, pp. 71ff).

17. Secondary Accident Cost Reduction

Both rules regarding liability and rules regarding damages determine which party bears which risk. For example, if a certain activity is subject to a rule of strict liability, but damages rules exclude certain types of losses from recovery, then the victim is the residual risk bearer of these losses. Hence, the combination of both types of rules determines the actual risk distribution.

If all parties are risk-neutral, they are only concerned with the *expected loss*, and the above analysis holds. However, if risk-aversion is introduced into the analysis, the results might change. Especially if parties differ in the degree of risk-averseness, the rules of liability and damages influence the way in which a given loss affects social welfare. The goal of secondary cost reduction aims at minimizing the impact of a loss on social welfare, by spreading it over a larger group, and/or by transferring it to the parties who are best able to bear it.

Shavell defines the socially ideal situation as a situation where all parties make optimal decisions regarding their care level and their activity level, and where risk averse parties do not bear risk, either because they are perfectly spread through insurance arrangements, or they are transferred to risk-neutral parties (Shavell, 2004, p. 259).

If insurance is not available, strict liability causes the injurer to bear the risk of the losses that are incorporated into the damages, while the victim bears the risk of the not-incorporated losses. Having to bear these risks can cause risk-averse parties to take excessive care measures, and/or to choose a too low activity level. Shavell therefore argues that if injurers are risk-averse and insurance is not available, it might not be socially desirable to make them fully liable (Shavell, 1982; 2004, p. 260). Under a negligence rule, the injurer can avoid having to bear risk by taking due care, so that the above problems do not occur. However, risk averse victims now face the risk, which can cause them to take excessive care and/or reduce their activity level too much. If the injurer is risk-neutral and the victim risk-averse, strict liability with full damages leads to the best outcome.

If insurance *is* available, parties will buy insurance to cover their risks. Tort liability then only needs to focus on providing optimal care and activity incentives, if insurers can observe care. If they cannot observe care, problems of moral hazard and adverse selection enter the analysis. One possible solution to those problems is incomplete coverage, but this again causes the insured to bear (some) risk, which frustrates the socially ideal situation (Shavell, 2004, pp. 261ff).

18. Empirical Research

In the above sections, Law and Economics insights regarding tort damages have been presented and discussed. It is interesting to see how ‘real world’ tort damages compare to the theoretical insights. Dewees, Duff and Trebilcock provide an extensive overview of empirical research on accident law, in which they analyze to which extent tort law in five different categories of accidents (automobile, medical, product-related, environmental and workplace accidents) is able to reach the goals of deterrence, compensation and corrective justice (Dewees et al., 1996, pp. 5ff). They perform both an *input analysis* (how does real tort law relate to the theoretical optimal rules) and an *output analysis* (how does the system perform in practice). In the current section, I will briefly discuss their findings, in as far as they are relevant for the topic of this chapter on tort damages. The interested reader is referred to the extensive references at the end of each chapter in their book.

In automobile accidents, tort damages fall short of the theoretical ideal of full compensation which is needed to minimize the social costs of accidents. First, many jurisdictions impose limits on recovery for pain and suffering. In Sections 3 and 6 above it became clear that those losses should be included in the amount the injurer has to pay, unless they are so small that the reduction in administrative costs yielded by neglecting them outweighs the decrease in care

incentives. Second, in some jurisdictions collateral benefits are subtracted from the tort damages, so that the injurer is not faced with the full costs he has caused. Third, damages for fatal accidents are very low, when compared to the theoretical desirable amounts (Hensler et al., 1991; Viscusi, 1991; Galanter, 1996; Dewees et al., 1996, pp. 17ff). Furthermore, economic losses are generally undercompensated, and this problem increases with the severity of the injuries.

Tort law in automobile accidents also fails to reach the compensation goal, where optimal compensation is based on the amount for which a rational person would insure. Most rules are negligence-based so that non-negligent losses are not compensated, and neither are the losses that the victim inadvertently inflicts upon himself. Furthermore, the defense of contributory negligence completely bars recovery, even if the victim only made a small mistake. More than one third of the victims of traffic accidents is left without compensation (Dewees et al., 1996, p. 30). Finally, tort law is a slow and expensive way of providing compensation (Dewees et al., 1996, pp. 34ff).

In medical malpractice, as in automobile accidents, recovery for pain and suffering is limited, collateral benefits are deducted and damages for fatal accidents are too low. In addition, different than with automobile accidents, only a small fraction of all victims files a claim. In cases that are being tried, juried tend to award high damages in medical malpractice cases. However, over 90% of the cases is settled outside of court. The settlement awards are often too low, partly due to the pressing need of injured plaintiffs (Dewees et al., 1996, pp. 98ff).

Product liability suffers from the same problems, and even less victims consider filing a claim. It turns out that punitive damages are not used as an instrument to tackle this problem, as was suggested in Section 8 (Dewees et al., 1996, pp. 194ff).

In environmental accidents, plaintiffs can recover for economic loss, costs of restoration and pain and suffering, but generally not for pure economic loss, emotional stress, aesthetic or recreational loss or increased risk of injury in absence of actual proof of injury. Hence, not all social losses are encompassed in tort damages. This holds even more with losses to the ecosystem where no individual can sue, or future losses. Punitive damages do not seem to solve this problem. Only few cases are tried, due to e.g. problems of proving causation, statutes of limitation and standing (Dewees et al., 1996, pp. 272ff).

In workplace injuries, finally, damages are too low as well, especially in fatal accidents. With regards to occupational diseases, the long latency period (of e.g. asbestos disease) further decreases the potential deterrent role of tort law, due to the discount factor applied to future costs and benefits. And in cases where the disease has killed the employee, the problem of undercompensation for fatalities enters again. Many work-related accidents and diseases happen to people not poor enough for subsidized legal aid, but for whom the costs of a lawsuit might be too high to actually file a claim. Hence, the expected damages

for the employer fall even further (Deweese et al., 1996, pp. 350ff. Also see Lott and Manning, 2000).

Helland and Tabarrok investigate the effect of composition of the jury pool on tort damages. According to their research, the average tort award increases as black and Hispanic county population rates increase and especially as black and Hispanic county poverty rates increase. A 1% increase in these populations leads to an average increase in tort damages of 3-10% (Helland and Tabarrok, 2003).

19. Conclusion

As a starting point, tort damages should be *full* in the sense that the injurer should internalize all externalities he has caused, in order to provide him with the correct care and activity incentives. Under a negligence rule, however, damages only need to be high enough to make due (optimal) care more attractive than a lower care level. Whether or not the victim's litigation costs should be compensated, depend on the productiveness of care measures and the willingness to sue. Victims should receive incentives to take optimal care themselves, and to optimally mitigate losses.

The injurer should pay for both pecuniary and nonpecuniary losses, unless the increase in administrative costs caused by the need to assess the latter outweighs the improvement in care and activity incentives. Pure Economic Loss should not always be compensated, as it does not always lead to social losses. The desired level of accuracy in assessing losses is determined by a weighing of administrative costs and behavioral incentives.

Damages for fatal accidents are too low from a Law and Economics point of view, because they do not incorporate the loss of life from the deceased. Literature regarding the Value of a Statistical Life, the Value of a Statistical Life Year and Quality Adjusted Life Years might provide valuable insights in order to reach a better level of damages for fatal accidents. It remains to be seen whether the surviving relatives should receive these damages. The same is true for damages for nonpecuniary losses, because a rational victim would not insure against those losses. Hence, the injurer should pay damages for these losses, but the victim should not receive compensation. Therefore, liability should be decoupled.

Topics such as uncompensated losses, limitation and judgment proof suggest that negligence rules function better than strict liability. The difference is mainly caused by the fact that the reward on careful behavior is larger under negligence. However, if a causal relationship between the negligence and the losses is required, this difference disappears.

Punitive damages are seen as an instrument to combat the problems that occur when the injurer receives too little behavioral incentives from the tort system. Increasing the amount he has to pay when found liable can improve his incentives.

Empirical research suggests that many features of tort law deviate from the theoretical optimal system. Damages for nonpecuniary losses are inadequate, collateral benefits are sometimes subtracted from damages, and fatal accidents remain grossly undercompensated. Furthermore, the probability of being held liable is far below 100%, yet punitive damages are not used to tackle this problem. The insights developed in the Law and Economic literature regarding tort damages might be used as guidelines in order to improve the functioning of the tort system.

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